

WHAT IS CLAIMED IS:

1. An ink jet ink composition comprising water, a humectant, and
a hyperbranched polymeric dye comprising a hyperbranched polymer having a dye
5 chromophore pendant on the polymer chain or incorporated into the polymer
backbone.

2. The composition of Claim 1 wherein said hyperbranched
polymer having a dye chromophore pendant on the polymer chain has the formula:
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wherein:

HB is a hyperbranched polymer core;

D is a dye moiety; and

15 n is an integer of at least 2.

3. The composition of Claim 2 wherein said HB is a polyamide,
polyester, polyether, vinylic polymer, polyimine, polysiloxane, polyesteramide or
polyurethane.
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4. The composition of Claim 2 wherein said HB is prepared by a
chain polymerization of a monomer of the formula $\text{M}^1-\text{R}^1-\text{M}^2_m$ wherein (i) R^1 is a
linear or branched alkyl, carbonyl, or aromatic moiety; (ii), M^1 and M^2 are
reactive groups that react independently of each other in which M^1 is a
25 polymerization group and M^2 is a precursor of a moiety M^{2*} which initiates the
polymerization of M^1 as a result of being activated; and (iii), m is an integer of at
least 1.

5. The composition of Claim 2 wherein said HB is prepared by a
30 condensation or addition polymerization of a monomer of the formula $\text{M}^3-\text{R}^2-\text{M}^4_p$,
wherein (i) R^2 is a linear or branched alkyl or aromatic moiety; (ii), M^3 and M^4 are

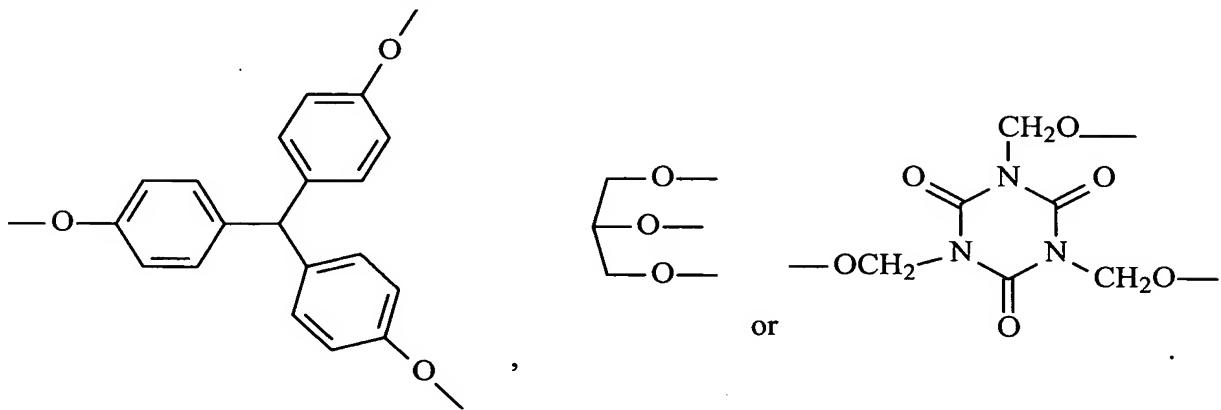
groups that undergo a condensation or addition reaction; and (iii), p is an integer of at least 2.

6. The composition of Claim 2 wherein said HB is prepared by a
5 condensation or addition polymerization of a monomer of the formula $R^2\text{-}M^5_q$ and
 $R^3\text{-}M^6_t$ wherein (i) R^2 is as defined above and R^3 is a linear or branched alkyl or
aromatic moiety; (ii), M^5 and M^6 are groups that undergo a condensation or
addition reaction; and (iii), q is an integer of at least 2 and t an integer of at least 3.

7. The composition of Claim 4 wherein M^1 is a non-substituted or
10 substituted vinylic group, M^2 is X, $-\text{CH}_2\text{X}$ or $-\text{CH}(\text{CH}_3)\text{X}$ wherein X is Cl, Br, I,
 S-C(=S) , YR^4R^5 or $-\text{O-NR}^4\text{R}^5$, Y=O or N, and R^4 and R^5 are each independently
 $-(\text{CH}_2)_r$ ($r = 1-12$), $-\text{C}_6\text{H}_5$, $-\text{C(O)O}$, or C(O) .

8. The composition of Claim 5 wherein M^3 and M^4 are each
15 independently $-\text{COOH}$, $-\text{OH}$, $-\text{C(O)Cl}$, epoxy, anhydride, NH, or NH_2 , and R^2 is
 $-\text{C}_6\text{H}_3-$, or $-(\text{CH}_2)_s\text{-C(R}^6\text{)}$ - wherein R^6 is a linear or branched alkyl or aromatic
group and s is an integer of 1-14.

9. The composition of Claim 6 wherein M^5 and M^6 are each
20 independently $-\text{COOH}$, $-\text{OH}$, $-\text{C(O)Cl}$, epoxy, anhydride, NH or NH_2 , and R^3 is
 $-\text{C}_6\text{H}_4-$, $-\text{C}_6\text{H}_4\text{-O-C}_6\text{H}_4-$, $-\text{C}_6\text{H}_3$, $\text{N}(\text{CH}_2)_3-$, $-\text{C}_4\text{H}_8-$, $-\text{C}_6\text{H}_{10}-$,



10. The composition of Claim 1 wherein said hyperbranched polymer having a dye chromophore incorporated into the backbone thereof is a polyamide, polyester, polyether, vinylic polymer, polyimine, polyesteramide or polyurethane.

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11. The composition of Claim 1 wherein said hyperbranched polymer having a dye chromophore incorporated into the polymer backbone is prepared by a chain polymerization of a monomer of the formula $M^1-R^7-M^2_m$ wherein R^7 is a linear or branched alkyl, carbonyl, or aromatic moiety containing 10 a dye chromophore and M^1 , M^2 and m are defined as in Claim 4.

12. The composition of Claim 1 wherein said hyperbranched polymer having a dye chromophore incorporated into the polymer backbone is prepared by a condensation or addition polymerization of a monomer of the 15 formula $M^3-R^7-M^4_p$ wherein R^7 is defined in Claim 11 and M^3 , M^4 and p are defined as in Claim 5.

13. The composition of Claim 1 wherein said hyperbranched polymer having a dye chromophore incorporated into the polymer backbone is 20 prepared by a condensation or addition polymerization of a monomer of the formula $R^8-M^5_q$ and $R^9-M^6_t$ wherein R^8 and R^9 are each independently a linear or branched alkyl or aromatic moiety, at least one of which contains a dye chromophore, and M^5 , M^6 , q and t are defined as in Claim 6.

25 14. The composition of Claim 1 wherein said dye chromophore is a mono- or poly-azo dye, basic dye, phthalocyanine dye, methine or polymethine dye, merocyanine dye, azamethine dye, quinophthalone dye, thiazine dye, oxazine dye, anthraquinone or metal-complex dye.

30 15. The composition of Claim 14 wherein said mono- or poly-azo dye is a pyrazoleazoindole.

16. The composition of Claim 14 wherein said metal-complex dye
is a transition metal complex of an 8-heterocyclazo-5-hydroxyquinoline.

5 17. The composition of Claim 1 wherein said humectant is
diethylene glycol, glycerol or diethylene glycol monobutylether.

10 18. The composition of Claim 1 wherein said hyperbranched
polymeric dye comprises about 0.2 to about 20 % by weight of said ink jet ink
composition.